PLANTS OF COAHUILA, EASTERN CHIHUAHUA, AND ADJOINING ZACATECAS AND DURANGO, IV[1]

IVAN M. JOHNSTON

SAURURACEAE

Anemopsis californica (Nutt.) H. & A. Bot. Beechey Voy. 390 (1841).

Anemopsis californica var. *subglabra* Kelso, Am. Midl. Nat. 13: 112 (1932).

COAHUILA: Parras, 1880, *Palmer 1184.* CHIHUAHUA: Chihuahua, common plant in swamps, with strong peppery smell, 1908, *Palmer 23;* Meoqui, *LeSueur 45.*

Ranging from California to southern Utah, eastern Colorado, and trans-Pecos Texas, and south to central Mexico. An aromatic herb, spreading by stolons and usually forming large colonies in wet soil. It has been collected in the Rio Grande bottoms in El Paso County, Texas.

SALICACEAE

Salix nigra Marsh. Arbust. Am. 139 (1785).

VERNACULAR NAMES: Sauz; Sauce.

COAHUILA: Hermanas, *Marsh 1599;* Monclova, *Marsh 1712;* Monclova, small tree along Rio Monclova, *White 1731;* Cuatro Cienegas, tree 6 m. tall, *White 1926;* Saltillo, tree becoming more than 30 ft. tall, 1898, *Palmer 27;* mountains 6 mi. east of Saltillo, 1880, *Palmer 1286;* San Antonio de los Alamos, tree 30 ft. tall, *Johnston & Muller 917;* Jimulco, medium-sized tree, Oct. 10, 1905, *Pringle 10086½.* CHIHUAHUA: Chihuahua, river-banks and low wet bottoms, tree 20–30 ft. tall, 1908, *Palmer 41, 42;* Jimenez, tree 3 m. tall, along Rio Florido, *White 2111.*

A widely distributed somewhat variable species ranging from northern Mexico northward to Canada. The material from Coahuila falls into var. *Lindheimerii* Schneider and that from Chihuahua approaches and is perhaps referable to var. *vallicola* Dudley (=*S. Gooddingii* Ball), a western phase of the species, which differs from var. *Lindheimerii* in having usually pubescent, rather than glabrous, fruit and pedicels and lighter, usually yellowish, twigs and branchlets. Schneider, Bot. Gaz. 65: 11 (1918), cites collections of var. *Lindheimerii* from Piedras Negras (*Trelease 133*) and from San Bernardo near the Chihuahua-Durango boundary (*Gregg 479*), and collections of var. *vallicola* from Juarez (*Stearns*) and Santa Eulalia Mts., (*Wilkinson*). On the Texan bank of the Rio Grande forms of the species, perhaps best referred to var. *vallicola,* have been collected from El Paso down to the Big Bend.

The plant is the large arborescent willow most common in our area. Usually associated with *Populus,* it is present along streams and rivers and elsewhere about perennial sources of water.

Salix amygdaloides Anderss. Proc. Am. Acad. 4: 53 (1858).

The type of var. *Wrightii* (Anderss.) Schneider, Bot. Gaz. 65: 14 (1918),

[1]The fifth paper in this series, published out of sequence in Jour. Arnold Arb. 25: 133–182 (April, 1944), included the families Loranthaceae to Nyctaginaceae.

was collected by Charles Wright, no. *1877*, in the bottoms of the Rio Grande, in the general vicinity of old Fort Quitman, Hudspeth Co., Texas. The variety, a trivial and vague one distinguished by narrow leaves, has been collected at various points along the river north into New Mexico. The species probably reaches its southern limit along the Rio Grande in northern Chihuahua.

Salix Thurberi Rowlee, Bull. Torr. Bot. Cl. 27: 252 (1900).

VERNACULAR NAME: Taraiz.

COAHUILA: Monclova, 1939, *Marsh 1650;* San Antonio de los Alamos, arroyo bank, one colony, 6–10 ft. tall, *Johnston & Muller 956;* Jimulco, by stream, Oct. 10, 1905, *Pringle 10086*. CHIHUAHUA: Sierra Encinillas, near Fierro, arroyo bank, shrub 3 m. tall, *Stewart 771;* near Pirámide, tree 12–20 ft. tall, along arroyo, *Johnston 8141;* 3 mi. west of Camargo, slender tree, 6 m. tall, *White 2280*.

Ranging from south-central Texas, the Lower Pecos Valley, and the Rio Grande Valley from the mouth of the river to beyond the Big Bend, and south to northern Nuevo Leon and northeastern Durango. In our area the species is usually recognized by its loose elongate aments of strigose capsules and very slender and elongate distinctly dentate leaves. Some forms of *S. Thurberi* from the Big Bend area of Texas have short, though distinctly dentate, leaves, and when represented by staminate plants may be confused with *S. taxifolia* var. *limitanea*. This variety of *S. taxifolia*, however, usually grows at higher altitudes and has shorter, usually entire leaves, and the sericeous capsules are crowded in short aments not much longer than broad. At some undetermined point along the Rio Grande, but presumably above the mouth of the Rio Conchos, *S. Thurberi* is replaced by *S. exigua*.

Salix exigua Nutt. var. **stenophylla** (Rydb.) Schneider, Bot. Gaz. 65: 25 (1918).

CHIHUAHUA: Banks of the Rio Grande near Juarez, May 4, 1885, *Pringle 220;* Bachimba Canyon, May 30, 1885, *Pringle 23*.

Chihuahua and northeastern Sonora northward through Arizona, New Mexico, and trans-Pecos Texas to Wyoming. In trans-Pecos Texas the species is known from the Davis Mts., and from the Rio Grande bottoms in El Paso and Hudspeth Counties. Readily distinguished from *S. Thurberi* by the form and position of the staminate aments, glabrous or nearly glabrous capsules, and entire leaves.

Salix taxifolia H.B.K. var. **limitanea** var. nov.

A varietate genuina differt foliis maturitate evidenter firmioribus pallidioribus glabrescentibus vel pilis albis gracilioribus rectis valde adpressis sericeo-vestitis.

COAHUILA: Arroyo del Tule, Sierra Hechiceros, bush along arroyo, 10 ft. tall, *Johnston & Muller 1367;* 8 km. northwest of El Tule, Sierra Hechiceros, tree along arroyo, 7 m. tall, *Stewart 533*. CHIHUAHUA: Valley near Chihuahua, Oct. 5, 1885, *Pringle 23½;* Majalca, *LeSueur 162;* Chihuahua, river bank where somewhat shady, not common, upright plant 8–10 ft. tall, 1908, *Palmer 39;* Bachimba Canyon, March 23, 1885, *Pringle 95;* 8 mi. north of San Lucas, road to Chihuahua, *White 2329*. DURANGO: Durango, 1896, *Palmer 473*. SONORA: Between San Pedro and Fronteras, *Hartmann 959;* Arroyo Bavispe, 1940, *Phillips 331*. TEXAS: Limpia Creek, Aug. 22 and 24, 1849, *Wright 669* (TYPE, Gray Herb.); Limpia Canyon, 1902, *Tracy & Earle*

210; Limpia Creek, 15 mi. west of Ft. Davis, 1926, *Palmer 30957;* Little Aguja Canyon, Davis Mts., 1931, *Moore & Steyermark 3125;* eastern Jeff Davis County, 1926, *Palmer 30499;* Cibolo Creek, above Shafter, 1942, *Hinckley 2512.* NEW MEXICO: Animas Valley, Hidalgo Co., 1928, *Wolf 2585.* ARIZONA: Rucker Canyon, Chiricahua Mts., *Blumer 1623;* Whitewater Creek, Chiricahua Mts., *Blumer 1247;* Palmerlee, Huachuca Mts., *Goodding 4641;* Swissholm Mts., 1884, *Toumey;* Rosemont, Santa Rita Mts., *Toumey 14;* Davidson Canyon, Santa Rita Mts., 1884, *Toumey;* Rillita River, June 22, 1884, *Pringle;* near Tucson, May 7, 1883 and June 23, 1884, *Pringle;* Rincon Mts., 1930, *McKelvey 1579.*

The var. *limitanea* includes most of the material which Schneider, Bot. Gaz. 65: 23 (1918), treated as referable to typical *S. taxifolia,* a species described from cultivated plants collected at Mexico City, Queretaro, and Celaya, in central Mexico. Our present plant ranges from trans-Pecos Texas to southern Arizona and south into northern Mexico. Intermediate forms, connecting it with the phases of *S. taxifolia* found in central, southern, and western Mexico, come from San Luis Potosi, Durango, southwestern Chihuahua, and eastern Sonora. The commonest form of *S. taxifolia* in central Mexico is var. *microphylla* (S. & C.) Schneider, which has short, proportionately broad leaves with evidently toothed margins. The typical form of *S. taxifolia* appears to be only an ecological variant. It is sporadic within the range of var. *microphylla* and is characterized by having larger more elongate obscurely toothed oblanceolate leaves. In general size and shape of leaves this typical form suggests var. *limitanea,* but it differs in having the leaves thinner and less firm in texture and the indument darker, coarser, and less appressed. Northern material representing var. *limitanea* can be quickly distinguished from the southern plants belonging to typical *S. taxifolia* and to var. *microphylla* by its more finely and closely pubescent leaves, lighter color, and generally cleaner and neater appearance. In addition, the thicker leaves tend to be somewhat larger in size, entire-margined, and in age glabrescent. Schneider suggests that the northern plants differ from the southern ones in having a dorsal as well as ventral gland in the staminate flowers. The material I have cited is variable in this respect.

Salix Bonplandiana H.B.K. Nov. Gen. et Sp. 2: 20 (1817).

CHIHUAHUA: Presa near Chihuahua, 1936, *LeSueur.*

Ranging from Guatemala to central Mexico and north along the western Sierra Madre into southern Arizona and southwestern New Mexico. The northern plants have been referred to var. *Toumeyi* (Britt.) Schneider, Bot. Gaz. 65: 20 (1918), but I have been unable to distinguish them from material collected in central and southern Mexico.

Salix lasiolepis Benth. Pl. Hartw. 335 (1857).

COAHUILA: San Lorenzo Canyon, mountains near Saltillo, 7000 ft., April 12, 1906, *Pringle 10210;* mountain canyon (Cañon Iglesia) southeast of Saltillo, Oct. 5, 1905, *Pringle 13708.* CHIHUAHUA: Sacramento Valley, northeast of Chihuahua, March 29 and Oct. 4, 1886, *Pringle 709.*

Ranging from western United States east to Idaho and trans-Pecos Texas and south into northern Mexico. Material from Chihuahua, Sonora, and Texas agrees well with the typical plants of California. The specimens from Coahuila and Nuevo Leon may represent a separable form and

may possibly be the same as *S. Schaffnerii* Schneider from San Luis Potosi.

Salix irrorata Anderss. Öfv. Svensk. Vet. Akad. Förh. 15: 117 (1858).

This species has been collected on the Texan bank of the Rio Grande opposite Chihuahua, just north of El Paso, by Charles Wright, no. *1873*. It ranges from Arizona to trans-Pecos Texas and north to Colorado. It is closely related to *S. lasiolepis* and appears to differ chiefly in having its stems conspicuously glaucous.

Salix paradoxa H.B.K. Nov. Gen. et Sp. 2: 20 (1817).

COAHUILA: Cañon del Agua, Sierra Madera, tree to 15 ft. tall, trunk 4 inches diameter with smooth tawny bark, sparse on rock slides about heads of canyons, *Muller 3242*.

The above-cited collection is sterile. It closely resembles fertile material from Cerro Potosi in the Sierra Madre of Nuevo Leon, and, like it, appears referable to *S. paradoxa*. The species is otherwise known from the mountains of central Mexico. The type came from Hidalgo.

Populus arizonica Sargent, Bot. Gaz. 67: 210 (1919).

Populus mexicana sensu Sargent, Silva 14: 73. *t. 733* (1902), Man. Trees No. Am. 162. *f. 136* (1905).

VERNACULAR NAMES: Alamo; Alamo cimarron.

COAHUILA: Piedras Negras, 1900, *Sargent;* Sierra del Carmen, Cañon Sentenela, *Wynd & Mueller 527;* Saltillo, June 4, 1888, *Pringle 2098;* Saltillo, *Sargent;* San Antonio de los Alamos, *Johnston & Muller 918*. CHIHUAHUA: Sierra Encinillas, near Fierro, tree 6 m. tall, *Stewart 787;* valley near Chihuahua, March 31, 1886, *Pringle 885* (TYPE of *P. arizonica*); 3 mi. west of Camargo, tree 20 m. tall, *White 2258, 2282;* Jimenez, tree along Rio Florido, 20 m. tall, *White 2112*.

This is the common *Populus* on the intermontane plateau of northern Mexico, growing with *Salix* along rivers and streams in the valleys and frequently cultivated about ranch-houses and in the towns when sufficient soil moisture is available. It ranges north into the Big Bend area of Texas and apparently into the valleys of southeastern Arizona. It grows in the valley of the Rio Grande at least as far west as the mouth of the Rio Conchos. Farther up the river, somewhere between Ojinaga and El Paso, the species is replaced by *P. Wislizeni*.

The species is closely related to *P. Fremontii* and particularly to the various forms of that species found in Arizona. It is characterized by its broad ovate-deltoid leaves, which have a truncate or obtuse and only rarely a slightly cordate base. The earliest leaves and those on vigorous shoots are usually rhombic, long-pointed, and with an acute or narrowly obtuse base. The outer bud-scales are usually densely hairy and the twigs pubescent. The short pedicellate capsules, hairy buds, truncate or obtuse leaf-bases, and the less firm texture of the leaves readily distinguish it from *P. Wislizeni,* and the hairy indument and large obtuse or truncate leaf-blades separate it from *P. Fremontii*.

Sargent published the name "*Populus arizonica,*" without accompanying description, as a new name for the plant he had earlier described and illustrated in the Silva as "*P. mexicana* Wesm." For its validity and application, the name *P. arizonica* accordingly rests on the plant which Sargent

had illustrated, described, and discussed as "*Populus mexicana*" in the Silva of North America 14: 73. *t. 733* (1902). A study of this work shows that his illustration and his description apply well to our present Mexican plant and poorly to the slender-stemmed glabrous plant of Arizona which later authors, including Sargent, have accepted as typical *P. arizonica.* The fruiting leafy branch illustrated in Sargent's Silva, and in all editions of his Manual, is drawn from *Pringle 885,* a plant collected near Chihuahua City. The detached large mature leaf portrayed in the Silva is a typical leaf of our Mexican plant. The specimens from which this leaf and the young male aments were drawn can not now be determined. They may have been drawn from Mexican or Arizonan material or a mixture of the two. Sargent cited *Pringle 885,* from Chihuahua, among other Mexican specimens, as representing *P. arizonica* var. *Jonesii* Sargent, Bot. Gaz. 67: 211 (1919). Nevertheless, since the name "*P. arizonica*" was not newly described when published but was based upon "*P. mexicana*" as described and illustrated in the Silva of North America, and since the larger and most distinctive parts of the plate in the Silva of North America are based on Pringle's collections and represent well our present Mexican plant, which is well covered in the accompanying text, I am forced to accept *Pringle 885,* from Chihuahua, as the type of *P. arizonica* Sarg. With the species thus typified the name *P. arizonica* Sarg. is based on very characteristic material of the common *Populus* of our area.

Populus Wislizeni (Wats.) Sargent, Silva No. Am. 14: 71. *t. 732* (1902).

CHIHUAHUA: Banks of the Rio Grande, Juarez, May 31, 1888, *Pringle 1993;* Juarez, 1899, *Rose & Hough 4202.*

Ranging from the Rio Grande Valley, from below El Paso, north through trans-Pecos Texas and New Mexico into southern Colorado. Readily recognized by its very slender and elongate fruiting pedicels and its cordate or reniform, only rarely truncate, leaf-bases.

JUGLANDACEAE

Carya illinoensis (Wang.) K. Koch, Dendr. 1: 593 (1869).

Carya Pecan (Marsh.) Engler & Graebn. Notizbl. Bot. Gart. Berlin, App. 9: 19 (1902).

VERNACULAR NAMES: Nogal liso; Nogal.

Reported as growing wild in northeastern Coahuila along the bottomlands of the Rio San Diego, Rio Rodrigo, and Rio Sabinas, by Pablo Frick, Mexico Forestal 1: 11–14. *fig.* (1923), and by Angel Roldan, Mexico Forestal 3: 30–32. *fig.* (1923). I have been told of pecan-trees which formerly grew about Muzquiz and Nacimiento. I have seen no specimens from Coahuila. However, the species is to be expected in northeastern Coahuila, for pecans have been collected in Val Verde (Devils River) and Uvalde Counties in adjoining Texas. The Arnold Arboretum has several specimens of the species collected near Monterrey, but they have no data indicating whether they were obtained from spontaneous or cultivated trees. The species is widely distributed in central United States and reaches its southern limit in northeastern Mexico.

Juglans microcarpa Berlandier in Berl. & Chovell, Diario Viage Comission de Límites bajo Mier y Teran 276 (1850).

Juglans nana Engelm. Proc. Am. Assoc. Adv. Sci. 5: 226 (1851).

Juglans rupestris Engelm. ex Torr. in Sitgreaves, Rep. Exped. Zuni & Colorado Rivers 171. *t. 15* (1853).

VERNACULAR NAMES: Nogalillo; Nogaillo.

COAHUILA: Hac. Mariposa near Puerto Santa Ana, *Wynd & Mueller 283;* Flores Pasture, Hac. Mariposa, *Marsh 313;* Cañon Bocatoche, becoming 20 ft. tall, *Muller 3120;* 9 mi. north of Hipolito, 10 ft. tall, frequent, *Johnston 7229;* Sierra Encantada, Cañon San Enrique, shrub 4 m. tall, *Stewart 1390;* Sierra del Pino, along arroyos near La Noria, *Johnston & Muller 509;* Sierra Hechiceros, 6 mi. east of El Tule, along dry arroyo, 1–4 m. tall, *Stewart 482;* Sierra Hechiceros, Cañon Indio Felipe, along banks of creek, *Stewart 134a.* CHIHUAHUA: 7½ mi. east of Victoria, bank of arroyo, 12 ft. tall, *Stewart & Johnston 1999.*

A large shrub or low rounded tree, generally less than 15 ft. tall, growing along open arroyos or on dry terraces near watercourses. It reaches its southern limit in our area and extends north into Texas and southeastern New Mexico.

The present species, the dwarf walnut, has generally passed as *J. rupestris*. That species, although attributed to Engelmann, was described and illustrated by Torrey, apparently on the basis of material collected by Bigelow along Devils River, Val Verde Co., Texas. Previous to Torrey's formal description of *Juglans rupestris* Engelm., however, two other binomials had been published for the species. These earlier names, though published without formal descriptions, are accompanied by descriptive comments sufficient to identify them. Since there can be no reasonable doubt as to the application of these early names I have accepted the older, *J. microcarpa* Berl. Berlandier collected *J. microcarpa* on Dec. 7, 1828, in the upper parts of Uvalde Canyon, Texas. He writes concerning it as follows: "A la orilla de los torrentes, y sobre todo, en la del arroyo principal, se encuentran nogales de una especie natural, cuyos frutos muy pequeños, parecidos á una grande avellana, tienen un Endocarpo muy duro, y por esto se ha descrito bajo el nombre de *Juglans Microcarpa.*" Berlandier was a trained botanist. His reference to a wild *Juglans* with a small fruit, the size of a hazelnut, which he found in Uvalde Canyon, is unmistakable. All botanists agree that the small fruit and the dwarf habit of the present species are its obvious distinguishing characters. These are well covered in Engelmann's publication of *J. nana*. In his general discussion of the flora of western parts of Texas, Engelmann writes as follows: "The stately walnut trees of your forests are there reduced to the low *Juglans nana*, a shrub, that bears nuts the size of a musket ball." Since the names *J. microcarpa* and *J. nana* were both published by botanists who mention in their comments diagnostic characters of the species, I believe that the names should compete with *J. rupestris* and that the oldest, *J. microcarpa*, should be taken up as the accepted name of the species.

Juglans major (Torr.) Heller, Muhlenbergia 1: 50 (1900).

Juglans major var. *major* Torr. in Sitgreaves, Rep. Exped. Zuni & Colorado Rivers 171. *t. 16* (1853).

VERNACULAR NAME: Nogal.

CHIHUAHUA: Vicinity of Chihuahua, 1908, *Palmer 141;* 3 mi. west of Camargo, tree 8 m. tall, *White 2284.*

A species ranging from western New Mexico and Arizona south in Chihuahua and Sonora to Durango. It is closely related to the more easterly *J. microcarpa* but is usually separable by its arborescent habit, much larger nuts, and larger, proportionately broader, generally fewer, evidently short-petiolulate leaflets. The bases of the leaflets are strongly oblique, with one side of the blade decurrent on the petiolule for at least a millimeter. The curved more elongate leaflets of *J. microcarpa* are subsessile, with the blade decurrent only very obscurely if at all.

Juglans major var. **Stewartii** var. nov.

A varietate typica differt foliolis 15–21 angustioribus et longioribus 7–12 cm. longis 13–19 mm. latis supra basim latissimis deinde apicem versus gradatim longe attenuatis curvatis.

COAHUILA: Sierra Hechiceros, Cañon Indio Felipe, common along stream in deep watered canyon, tree becoming 45 ft. tall, Sept. 18, 1940, *Johnston & Muller 1358* (TYPE, Gray Herb.); Cañon Indio Felipe, banks of creek, tree 12 m. tall, common, *Stewart 134.*

A plant agreeing with the western *J. major* in its arborescent habit, large fruits, and oblique decurrent leaflet-bases, and resembling *J. microcarpa* in its numerous elongate leaflets.

BETULACEAE

Ostrya virginiana (Mill.) Koch, Dendr. 2^2: 6 (1873).

COAHUILA: Sierra Gloria, July 1939, *Marsh 1878.*

A species of eastern United States that extends south into our area.

FAGACEAE

by CORNELIUS H. MULLER

Quercus Laceyi Small, Bull. Torr. Bot. Cl. 28: 358 (1901).

Quercus breviloba f. *Laceyi* Trel. Mem. Nat. Acad. 20: 102 (1924).

Quercus porphyrogenita Trel. Mem. Nat. Acad. 20: 51. *t. 39* (1924); Muller, Am. Midl. Nat. 18: 844 (1937).

Quercus microlepis Trel. & Muell. in Mueller, Bull. Torr. Bot. Cl. 63: 150 (1936).

Quercus glaucophylla sensu Mueller, Bull. Torr. Bot. Cl. 63: 150 (1936); Jour. Arnold Arb. 17: 162 (1936); non von Seemen (1900).

VERNACULAR NAME: Encino.

COAHUILA: Sierra del Carmen, Cañon Sentenela, *Wynd & Mueller 541, 617;* Rancho Agua Dulce, wooded canyon, east slope of Sierra Manuel, *Wynd & Mueller 345, 346;* Hac. Mariposa, ravine near Puerto Santa Ana, *Wynd & Mueller 230;* Hac. Mariposa, Sierra del Puerto Santa Ana, *Wynd & Mueller 262;* Sorpresa Spring, *Marsh 335, 344;* Palm Canyon, *Marsh 368;* Sierra Gloria, *Marsh 1954, 1978, 2002, 2005;* north slope of Sierra del Oso, Bocatoche, shrub to tree 6–30 ft. tall, common on slopes and arroyo-banks, *Muller 3143;* northwest slopes of Sierra San Lazaro, *Wynd & Mueller 170;* San Lorenzo Canyon near Saltillo, Apr. 12, 1906, *Pringle 10228;* Hillcoat Mesa lying west of Encantada Ranch, July 25, 1938, *Marsh 1426, 1432;* west of Buena Vista Ranch, July 14, 1938, *Marsh 2291;* Cañon Milagro, Sierra Guajes, 12 km. west of Hac. Encantada, tree 6–7 m. tall, *Stewart 1507, 1708;* Cañon San Enrique, Sierra Encantada, 5 km. west of Rancho Buena Vista, tree 5 m. tall, fairly common on hillside at mouth

of canyon, *Stewart 1369;* Sierra del Pino, La Noria, sparse on arroyo-banks, becoming 15 ft. tall, *Johnston & Muller 522;* Sierra del Pino, pine forest north of La Noria, scattered along arroyos, up to 30 ft. tall, *Johnston & Muller 559;* Sierra del Pino, high ridge west of La Noria, north-facing slopes below crest, shrub or tree 6–15 ft. tall, common, *Johnston & Muller 616;* west side of Potrero de la Mula, common on escarpment, 10–15 ft. tall, *Johnston 9207;* Sierra Madera, Cañon Pajarito, abundant small to moderate tree along upper arroyo and on slopes, up to 30 ft. tall, *Muller 3192;* Sierra Madera, Cañon del Agua, abundant in oak-pinyon zone of lower canyon, becoming 20 ft. tall, *Muller 3267;* Sierra Madera, Cañon Charretera, common on flats near La Cueva, tree 20 ft. tall, *Johnston 8933.*

Edwards Plateau region of Texas south in the mountains of Coahuila and the Sierra Madre of Nuevo Leon into Tamaulipas and San Luis Potosi. A well marked but polymorphic species usually most common along waterways in limestone mountains. The white scaly bark, the blue-green cast of its somewhat glaucous and rounded-lobed leaves, and the prominently thickened cup-scales are distinguishing characters. Our plants are obviously conspecific with the Texan *Q. Laceyi.* That species, however, seems closely related to southern Mexican plants comprising *Quercus* series *Glaucoides* Trel. and may possibly be conspecific with one of the older species in that assemblage. Our plant, in fact, has been identified with *Q. glaucophylla* von Seemen, a species first described from Oaxaca. For the present, however, it seems best to maintain the northern plants as distinct and to defer any possible change in their status until the southern species can be given a critical study and their precise relations established.

Quercus oblongifolia Torr. in Sitgreaves, Rep. Exped. Zuni & Colorado Rivers 173 (1853).

VERNACULAR NAME: Encino.

COAHUILA: San Antonio de los Alamos, along creek in canyon, tree 30–50 ft. tall with gray scaly bark, trunk 1–2½ ft. thick, locally common, *Johnston & Muller 863, 865, 866, 867, 869, 870.* CHIHUAHUA: Pirámide, about bouldery rock-masses on gravelly plain, spreading tree 25–30 ft. tall with gray scaly bark, *Johnston & Muller 1425;* 7 mi. south of Pirámide, scattered trees on north slope of grassy hills, *Johnston & Muller 1429.*

Arizona south into Sonora and Chihuahua and with outlying eastern stations in our area. The species is superficially very similar to *Q. Laceyi* and at times the exact differences are difficult to describe. *Quercus oblongifolia,* however, has a decidedly westerly distribution, is usually found on igneous soils, and has leaves differing from those of *Q. Laceyi* in being thicker, grayer, and less prominently veined beneath.

Quercus filiformis Muller, Am. Midl. Nat. 27: 473 (1942).

COAHUILA: Sierra Madera, Cañon Pajarito, sprawling shrub 6–24 inches tall, scattered on rocky arroyo-banks in dense moist pine-oak-maple forest in upper canyon, *Muller 3150* (ISOTYPE).

This species is known only from the type collection. Its procumbent habit, very slender stems, and thin leaf-blades distinguish it from *Q. Pringlei,* the species to which it is probably most closely related. It occurs in densely wooded moist canyons at middle elevations.

Quercus Pringlei von Seemen, Bot. Jahrb. 29: 96 (1900).

VERNACULAR NAME: Encino.

COAHUILA: Mountains near Saltillo, 7000 ft., 1–2 m. tall, Apr. 12, 1906, *Pringle 10199;* mountains near Saltillo, 6500 ft., 2–3 ft. tall, Nov. 6, 1905, *Pringle 13609;* Carneros Pass, limestone hills, Sept. 1, 1889, *Pringle 2382;* Carneros Pass, limestone hills, shrub 2–3 ft. tall, May 10, 1891, *Pringle 3702* (ISOTYPE); arroyo 3 km. southwest of Fraile, *Stanford et al. 344;* Sierra del Pino, common bush along high ridge-crest west of La Noria, 4–7 ft. tall, *Johnston & Muller 600;* Sierra Madera, high crest of main ridge east of Picacho Zozaya, low scrub oak 1–2 ft. tall on rocky open crest, *Johnston 9018;* Sierra Madera, Cañon del Agua, common on steep wooded canyon slopes, shrub becoming 10 ft. tall, *Muller 3206, 3222;* Sierra Mojada, Cañon Hidalgo, open hillsides below crest, fairly common, 7–8 m. tall, *Stewart 1084;* Sierra Mojada, Cañon San Salvador, very abundant in upper canyon, becoming 15 ft. tall, bark scaly and gray, *Muller 3300, 3300a, 3300b;* summit of Picacho Jimulco, *Stanford et al. 91, 111.* ZACATECAS: Valley 15 km. west of Concepcion del Oro, tree 7 ft. tall, *Stanford et al. 551.*

Ranging in western and southern Coahuila and northern Zacatecas, and south in western Nuevo Leon to San Luis Potosi. The species is characterized by its small, usually glabrous leaves with thickish blades and acute apices. The undersurface is at times somewhat glaucous. This plant, usually a small dense bush, occurs in mesic or dry situations at moderate and high elevations.

Quercus sinuata Walt. var. **breviloba** (Torr.) Muller, comb. nov.

Quercus obtusifolia var.? *breviloba* Torr. Bot. Mex. Bound. 206 (1859).

Quercus annulata Buckl. Proc. Acad. Nat. Sci. Phila. 1860: 445 (1860), non Smith in Rees (1819), non Korthals (1839–42).

Quercus san sabeana Buckl. ex Young, Familiar Lessons in Botany 507 (1873).

Quercus breviloba Sargent, Gard. & Forest 8: 93 (1895); Muller, Am. Midl. Nat. 18: 849 (1937).

COAHUILA: Rancho Agua Dulce, lower slopes of Sierra San Manuel, *Wynd & Mueller 308, 309, 311;* Rancho Agua Dulce, wooded canyon on east slope of Sierra San Manuel, *Wynd & Mueller 342, 344;* Sorpresa Spring, *Marsh 336;* Bocatoche, north slope of Sierra del Oso, abundant on slopes, shrub becoming 12 ft. tall, *Muller 3140, 3141.*

Ranging from the Edwards Plateau and from the Big Bend area, Texas, south in the mountains of eastern Coahuila. It has been reported as far south as the vicinity of Monterrey and has been discovered recently in southeastern Presidio County, Texas (Mexican Canyon, just off Fresno Canyon, *Hinckley 2295*), and hence may be expected south of the Rio Grande in northeastern Chihuahua and northwestern Coahuila. Past writers have maintained our plant as specifically distinct from the eastern *Q. sinuata,* but this seems difficult to justify since intermediate forms arise wherever *Q. sinuata* is exposed to xeric conditions or *Q. breviloba* to mesic conditions.

Quercus Greggii (A. DC.) Trel. Contr. U. S. Nat. Herb. 23: 185 (1922), Mem. Nat. Acad. 20: 78. *t. 109* (1924).

Quercus reticulata β *Greggii* A. DC. Prodr. 16^2: 34 (1864).

Quercus Loeseneri Trel. Mem. Nat. Acad. 20: 79. *t. 110* (1924).

VERNACULAR NAME: Encino.

COAHUILA: San Antonio de las Alanzanas, frequent, 30–40 ft. tall, Aug. 31, 1848, *Gregg 380* (ISOTYPE); mountains near Saltillo, 7000 ft., 4–6 ft. tall, Nov. 6, 1905, *Pringle 10120* (isotype of *Q. Loeseneri*); Sierra Madera, Cañon del Agua, shrub up to 12 ft. tall, dominant in chaparral on upper slopes and around peaks, *Muller 3239;*

Sierra Madera, Cañon del Agua, large shrub or tree up to 25 ft. tall, principal constituent of oak forest in moist densely wooded upper canyon, *Muller 3233;* Sierra Madera, Cañon del Agua, shrub or small tree up to 15 ft. tall, with thin gray scaly bark, common in open oak forests on steep canyon slopes, *Muller 3207;* Sierra Madera, common in moist shady coniferous forests on crest of high main ridge east of Picacho Zozaya, shrub 4–8 ft. tall, *Johnston 9022, 9022a.*

Mountains of central and southeastern Coahuila south in the Sierra Madre of Nuevo Leon to San Luis Potosi. A plant of moist canyons and forests in the high mountains.

Quercus Greggii f. **subglabra** Muller, f. nov.

A species recedit foliis subglabratis non revolutis non crassis, venis supra vix impressis.

COAHUILA: Sierra Madera, Cañon del Agua, tree becoming 20 ft. tall, sparse along the moist densely wooded upper arroyos, Sept. 9, 1939, *Muller 3238* (TYPE, Gray Herb.); Sierra Madera, Cañon del Agua, shrub or small tree up to 15 ft., sparse in moist pine oak forest on steep slopes, *Muller 3227, 3227a.*

This form differs conspicuously from typical *Q. Greggii* in having leaves with the lower face devoid of dense fulvous tomentum, the upper face with only weakly impressed veins, and the margins non-revolute. The naming of forms such as this is of doubtful value except when the variant may cause difficulty in delimiting the species. *Quercus Greggii* without its dense tomentum, its revolute leaf-margins, and its veins strongly impressed on the upper leaf-surface presents pronounced differences in aspect, and the relationship of this form to typical *Q. Greggii* might fail to be recognized by those who have not studied it in the field and have only herbarium material before them.

Quercus reticulata Humb. & Bonpl. Pl. Aequin. 2: 40. *t. 86* (1809).

Quercus durangensis Trel. Mem. Nat. Acad. 20: 73. *t. 91* (1924).

Quercus diversicolor Trel. Mem. Nat. Acad. 20: 73. *t. 92–94* (1924); Muller, Am. Midl. Nat. 24: 708. *fig. 3* (1940).

Quercus rhodophlebia Trel. Mem. Nat. Acad. 20: 74. *t. 95–97* (1924).

COAHUILA: Sierra del Carmen, Sept. 12, 1936, *Marsh 829;* Sierra del Carmen, Cañon Sentenela, high slopes with northwest exposure, *Wynd & Mueller 634, 636, 641.*

Arizona, New Mexico, and trans-Pecos Texas and south along the Sierra Madre Occidental to central Mexico. Entering our area in northern Coahuila. The several species described by Trelease are obviously only forms of a very polymorphic species which recur throughout the range of the species regardless of geographical location. The typically obovate leaves mucronately toothed about the apex, the very prominent reticulum of the lower leaf-surface, and the long-stalked fruit with loose thin cup-scales very readily distinguish this species from others within our range.

Quercus pungens Liebm. Overs. Danske Vidensk. Forhandl. 1854: 171 (1854); Muller, Am. Midl. Nat. 24: 710. *fig. 5* (1940).

Quercus undulata δ *Wrightii* Engelm. Trans. St. Louis Acad. 3: 382 (1876).

Quercus undulata var. *pungens* Engelm. Trans. St. Louis Acad. 3: 392 (1877).

VERNACULAR NAME: Encino.

COAHUILA: Sierra del Carmen, Sept. 2, 1936, *Marsh 870;* Bocatoche, north slope of Sierra del Oso, shrub to 12 ft., sparse on slopes, *Muller 3142;* escarpment on west side of Potrero de la Mula, lower and middle slopes, bush 8–12 ft. tall, *Johnston 9197, 9206;*

high ridge at west end of Sierra Fragua north of Puerto Colorado, a few shrubs about rocks on crest, 5–8 ft. tall, *Johnston 8766;* Puerto Colorado, deep ravines about summit of red sandstone cliffs, shrub becoming 12 ft. tall, *Johnston 8699, 8700;* Sierra del Pino, Dec. 1937, *LeSueur 1501;* Sierra del Pino, Cañon Ybarra, fairly common on arroyo-banks, shrub 2–4 m. tall, *Stewart 1810, 1811, 1812;* Sierra Planchada, Cañon Gringo, banks of dry arroyo in upper canyon, common, shrub 2–6 m. tall, *Stewart 1025, 1030;* Sierra Mojada, Cañon San Salvador, common in middle and upper canyons and arroyos, tree with scaly gray bark, becoming 12 ft. tall, *Muller 3299, 3299a;* west side Valle de Delicias, 3 km. southwest of La Botica, common tree on arroyo-banks, 8 m. tall, *Stewart 2863;* 11 km. northeast of Jimulco, 10–12 ft. tall, *Stanford et al. 64.* CHIHUAHUA: Hills between Alamos Chapado and Alamitos, canyon 18 mi. west of San Carlos, waif tree 6 ft. tall on canyon floor, *Johnston & Muller 26;* Sierra San Carlos, lower part of canyon along road to mines, basally branched shrub 6–12 ft. tall, *Johnston & Muller 50;* Rancho Madera, southeastern base of Sierra Rica, arroyo-banks, common shrub 4 m. tall, *Stewart 2484;* Sierra Almagre, deep moist shaded canyon, up to 30 ft. tall, *Johnston & Muller 1151;* Sierra Almagre, common along arroyos, shrub 6 ft. to tree 20 ft. tall, *Johnston & Muller 1166;* Sierra Diablo, Canyon Rayo, fairly common on arroyo-banks, shrub 4–6 m. tall, *Stewart 955;* Sierra Santa Eulalia, March 27 and Sept. 19, 1885, *Pringle 172, 353;* Sierra Santa Eulalia, El Poza, shrub 1 m. tall, *White 2421.*

Ranging from Arizona and New Mexico through trans-Pecos Texas and south in Chihuahua and Coahuila into Nuevo Leon and Tamaulipas, usually confined to dry limestone slopes and along arroyos at lower elevations in the mountains. The leaves have rough almost sandpaper-like surfaces, imparted by their sparse short stiff pubescence. The species may commonly be recognized by this character alone. Although our plant has been treated as a variety of *Q. undulata,* it is not closely related to that species. *Quercus undulata* is related to *Q. Gambelii. Quercus pungens* is related to neither of these two species. When *Q. undulata* and *Q. pungens* occur on the same mountain ranges, the former is confined to the very highest elevations, while the latter occupies the lower belt of woody vegetation, the two being separated by a belt of several thousand vertical feet in which neither occurs.

A few of the specimens here referred to *Q. pungens* were formerly treated as belonging to *Q. Vaseyana* Buckl. Material from Nuevo Leon (including the type of *Q. sillae* Trel.) belongs to *Q. Vaseyana,* but no collections truly belonging to that species are available from Coahuila or Chihuahua. However, the presence of the species near the Rio Grande, along the lower Pecos and Devils Rivers, and in the limestone country of the western Edwards Plateau, in Texas, makes it almost certain that *Q. Vaseyana* will be found in the similar country in adjoining northern Coahuila. *Quercus Vaseyana* and *Q. pungens* are very closely related and frequently rather difficult to distinguish, the most satisfactory differences being the presence of harsh pubescence on the leaves of *Q. pungens* and its absence on the generally less lobed leaves of *Q. Vaseyana,* cf. Muller, Am. Midl. Nat. 27: 712. *fig. 6* (1940).

Quercus invaginata Trel. Mem. Nat. Acad. 20: 87. *t. 137, 138* (1924).

Quercus invaginata f. *Purpusiana* Trel. Mem. Nat. Acad. 20: 87. *t. 138* (1924).

VERNACULAR NAME: Encino.

COAHUILA: Hillcoat Canyon, west of Buena Vista Ranch, July 13, 1938, *Marsh*

1276; Hillcoat Mesa lying west of Encantada Ranch, July 25, 1938, *Marsh 1419, 1419a, 1420, 1421, 1428;* Sierra Gloria, 1939, *Marsh 1953, 1955, 1974, 1997;* Bocatoche, north slope of Sierra del Oso, shrub or small tree, 2–12 ft. tall, dominant on lower arroyo slopes and in canyons, *Muller 3136, 3137, 3138, 3144;* Sierra San Lazaro, Puerto San Lazaro, abundant in shrub zone on dry slopes, shrub 3–8 ft. tall, usually in clumps of 6–15 trunks up to 2 in. diameter, *Muller 3066, 3067;* San Lazaro, rocky slopes of Puerto San Lazaro, *Wynd & Mueller 138, 139, 162;* Sierra de la Paila, Oct. 1910, *Purpus 5029* (ISOTYPE); Sierra de la Paila, Oct. 1910, *Purpus 5030* (isotype of f. *Purpusiana*); western escarpment of Potrero de la Mula, large shrub 8–12 ft. tall, on middle slopes, *Johnston 9210;* Sierra San Vicente, Cañon Espantosa, about 20 km. southeast of Cuatro Cienegas, *Schroeder 76, 98;* Sierra del Pino, pine forest in middle of sierra north of La Noria, moist shaded arroyos, abundant, up to 30 ft. tall, *Johnston & Muller 560;* Sierra del Pino, vicinity of La Noria, on flats and adjacent open slopes, bush usually 3–6 but frequently 10 ft. tall, abundant, *Johnston & Muller 439, 440, 520, 668, 710;* Sierra del Pino, near mouth of main south canyon, sparse along arroyo, becoming 20 ft. tall, *Johnston & Muller 378;* west base of Picacho del Fuste, along arroyo in small canyon, *Johnston 8457;* tableland north of Cañon del Cuervo Chico, crest of low rounded limestone hill, rare, small tree 15 ft. tall, *Johnston 8550;* Sierra Madera, Cañon Charretera near La Cueva, rocky flat, element in oak chaparral, bush 4–6 ft., *Johnston 8952;* Sierra Madera, Cañon Charretera near La Cueva, rocky flats, tree 20–30 ft. tall, *Johnston 8934;* Sierra Madera, Cañon Charretera, coarse bush in lower canyon, 8–12 ft. tall, *Johnston 9167, 9168;* Sierra Madera, Cañon Pajarito, common in pinyon and shrub zones of lower canyon, shrubs or small trees, 10–20 ft. tall, *Muller 3148, 3149, 3160, 3161;* Sierra Cruces, Cañon Tinaja Blanca, common on north slopes low on canyon side, small tree 10–15 ft. tall, *Johnston & Muller 300, 301, 302, 304;* Cañon La Luz, 3 mi. south of San José, common tree in canyon, *Johnston & Muller 1005, 1006;* San Antonio de los Alamos, along creek in canyon, tree 30–50 ft. tall, trunk 1–2.5 ft. thick, bark gray and scaly, *Johnston & Muller 864, 868, 871, 872.*

Ranging in middle and western Coahuila, frequent at middle altitudes on the mountains and descending along arroyos to the foothills. The acorn-cups in the type material from Sierra de la Paila described by Trelease have loosely inrolled margins, which give them an inflated appearance. Such invaginate excessively inflated cups are common in the species but individual trees of one population, otherwise identical, may have cups variously inflated and some even indistinguishable from those of *Q. grisea.* As a matter of fact the present species is often very difficult to distinguish from *Q. grisea* in northwestern Coahuila, where the two species meet. However, the broad flat dentate leaf-blades of typical *Q. invaginata,* lacking the dense tomentum of *Q. grisea,* make the separation of the two species obligatory, especially since the similarities between them do not arise from any close genetic relationship.

Quercus intricata Trel. in Standl. Contr. U. S. Nat. Herb. 23: 185 (1922), Mem. Nat. Acad. 20: 84. *t. 126–128* (1924); Muller, Am. Midl. Nat. 24: 710. *fig. 4* (1940).

Quercus microphylla β crispata A. DC. Prodr. 16²: 36 (1864).

Quercus intricata f. *ovata* Trel. Mem. Nat. Acad. 20: 85. *t. 128* (1924).

Quercus intricata f. *erratica* Trel. Mem. Nat. Acad. 20: 85. *t. 128* (1924).

VERNACULAR NAMES: Encino; Charasquilla.

COAHUILA: Puerto San Lazaro, abundant on open slopes of Sierra San Lazaro, shrub 1–4 ft. tall, *Muller 3085;* Puerto San Lazaro, Sierra San Lazaro, sparsely scattered in the shrub zone, shrub to 2 ft. tall, much branched at base, *Muller 3065;* San Lazaro, rocky slopes of Puerto San Lazaro, *Wynd & Mueller 163;* Buena Vista, south of Saltillo, shrub-oak 2–5 ft. tall, abundant, July 24, 1848, *Gregg 296* (ISOTYPE of *Q. microphylla β crispata* and *Q. intricata*); San Lorenzo Canyon, southeast of Saltillo,

canyon-sides, forming thick crowded clumps 3–5 ft. tall, 1904, *Palmer 431;* San Lorenzo Canyon, southeast of Saltillo, 1905, *Palmer 552, 553, 554, 555, 556, 557, 745, 746* (isotype of f. *ovata*), *747, 748, 751;* Carneros Pass, limestone hills, 2–3 ft. tall, May 10, 1891, *Pringle 3701;* Carneros Pass, 2 ft. high, Sept. 10, 1889, *Pringle 2862;* Sierra del Pino, 1937, *LeSueur 1502;* Sierra del Pino, Cañon Ybarra, fairly common on arroyo-banks, shrub 3 m. tall, *Stewart 1861;* Sierra del Pino, high western ridge near old log-slide, forming chaparral along rocky arid crest, 1–3 ft. tall, *Johnston & Muller 565;* Sierra del Pino, pine forests north of La Noria, abundant as scrub in open conifer forest, clumps 4 ft. tall, *Johnston & Muller 561;* Sierra del Pino, high ridge west of La Noria, abundant along crest and on adjacent slopes, *Johnston & Muller 610;* Sierra del Pino, vicinity of La Noria, clumps 2–4 ft. tall, *Johnston & Muller 441, 442, 443, 444, 445;* tableland north of Cañon del Cuervo Chico, forming thickets 3–6 ft. tall on low rounded limestone hills, *Johnston 8551;* Sierra Madera, scrub oak on high rocky open crest of main ridge east of Picacho Zozaya, 1–2 ft. tall, common, *Johnston 9018a;* Sierra Madera, Cañon Charretera near La Cueva, low bush 2–4 ft. tall on rocky flats, *Johnston 8951;* Sierra Madera, Cañon Pajarito, abundant on dry open slopes in upper arroyo, shrub 1–4 ft. tall, *Muller 3191;* Sierra Fragua, thickets 2–5 ft. tall with pines on eastern slopes of high ridge north of Puerto Colorado, *Johnston 8779;* Sierra Cruces, Cañon Tinaja Blanca, common on north slopes low down on canyon-side, shrub to 3 ft. tall, *Johnston & Muller 299, 303;* Sierra Cruces, foothills 3 mi. southeast of Santa Elena, sparse on arroyo-banks, 3 ft. tall, *Johnston & Muller 1260;* Sierra Mojada, Cañon San Salvador, crests, dominant shrub becoming 5 ft. tall, *Muller 3310;* Sierra de Parras, Apr. 1905, *Purpus 1137;* Sierra de Parras, *Shreve & Tinkham 9876, 9888;* Sierras Negras, south of Parras, tree 8–10 ft., *Stanford et al. 147.* CHIHUAHUA: Sierra Almagre, sparse in open rocky arroyo, becoming 5 ft. tall, *Johnston & Muller 1182;* Sierra Diablo, common about margins of meadows high on northwest end of sierra, 1–2 m. tall, *Stewart 961.* ZACATECAS: Cedros, 1908, *Lloyd 130.*

Ranging from trans-Pecos Texas (Davis and Chisos Mts.) south in Coahuila and adjacent Chihuahua and Zacatecas into Nuevo Leon. A xeric species characteristic of sunny slopes and flats and exposed dry ridges. It is commonly associated with *Q. invaginata* in central Coahuila and is one of the characteristic species in the Coahuilan oak-chaparral. The small revolute leaves with a dense buff tomentum beneath and the low habit of growth distinguish it.

Quercus arizonica Sargent, Gard. & Forest 8: 92 (1895).
Quercus Sacame Trel. Mem. Nat. Acad. 20: 89. *t. 142* (1924).
Quercus endemica Muller, Am. Midl. Nat. 18: 846 (1937).

VERNACULAR NAME: Encino.

COAHUILA: Sierra del Carmen, Cañon Sentenela, *Wynd & Mueller 540, 565, 638* (isotype of *Q. endemica*); Sierra Cruces, Cañon Encinal, 8 km. southwest of Santa Elena, frequent in shady canyon, deciduous tree becoming 12 m. tall, trunk 75 cm. thick, *Stewart 2273, 2274;* 10 km. southwest of Santa Elena, side of canyon, tree 8 m. tall, trunk 5 dm. thick, *Stewart 1148.* CHIHUAHUA: Sierra Organos, canyon west of Organos, large live oak, tree said to be only one of kind in region, *Stewart & Johnston 2078.* TEXAS: Chisos Mts., Boot Spring, *Mueller 7936* (distributed as *Q. reticulata*).

Ranging from Arizona south in the highland of eastern Sonora and western Chihuahua into Durango and extending eastward in scattered stations into trans-Pecos Texas and Coahuila. The material from our area comes from the ragged eastern edges of the range of *Q. arizonica* where it is a rare relict, and its characters are so masked by aberrations characteristic of such edge-of-the-range individuals that the identity of some specimens has not been immediately evident. Though some plants from the Chisos Mts.,

formerly referred to *Q. endemica,* cf. Muller, Am. Midl. Nat. 24: 706 (1940), are probably best referred to *Q. grisea,* the Chisos specimen cited above, however, seems clearly to belong to *Q. arizonica. Quercus arizonica* is characterized by oblong to oblanceolate leaves with the reticulum very prominent beneath. It is distinguished from *Q. reticulata* by its more narrow leaves, its shorter fruiting peduncles, its thickened and tightly appressed cup-scales, and its occurrence at much lower and drier levels.

Quercus cordifolia Trel. Mem. Nat. Acad. 20: 84. *t. 125* (1924).
Quercus striatula Trel. Mem. Nat. Acad. 20: 93. *t. 151* (1924).
Quercus striatula f. *otinapensis* Trel. Mem. Nat. Acad. 20: 94. *t. 152* (1924).

COAHUILA: Carneros Pass area, small tree 20 ft. tall, trunk up to 1 ft. thick, July 1880, *Palmer 1278* (GH, ISOTYPE); Carneros Pass area, 1880, *Palmer 1178* (AA).

Ranges from southern Coahuila into Durango, Zacatecas, and Nuevo Leon. Apparently most abundant in Nuevo Leon. This species is very polymorphic as to leaf-size and -shape and as to habit. It varies from a small tree with moderate-sized leaves, very similar to *Q. grisea,* to a diminutive shrub (3–6 ft. tall) with tiny leaves. Although *Q. cordifolia* is very similar to *Q. grisea* in one of its forms, it is by no means conspecific with that species. Unfortunately the type and other collections from the type locality are all of the large-leaved form. This form, however, is not separable from the diminutive form, there being many intermediates. *Quercus cordifolia* occurs at medium and high altitudes in the larger mountain masses and does not extend down into the shrub and small tree zones as does *Q. grisea* so commonly further north.

Quercus grisea Liebm. Overs. Danske Vidensk. Forhandl. 1854: 171 (1854); Muller, Am. Midl. Nat. 24: 706. *fig. 1* (1940).
Quercus undulata var. *grisea* Engelm. Trans. St. Louis Acad. 3: 393 (1877).
Quercus santaclarensis Muller, Am. Midl. Nat. 19: 583 (1938).

VERNACULAR NAME: Encino.

COAHUILA: Sierra del Carmen, Sept. 6–12, 1936, *Marsh 832, 854;* western slopes of Sierra del Carmen, 8 km. northeast of Hac. Encantada, fairly common on hillsides, tree 5–6 m. tall, *Stewart 1552;* Sierra del Pino, abundant in dense pine forests in middle sections of sierra north of La Noria, tree 45 ft. tall, *Johnston & Muller 572;* Sierra del Pino, La Noria, common along arroyo, becoming 20 ft. tall, *Johnston & Muller 521;* Sierra Hechiceros, Cañon Indio Felipe, spreading tree, becoming 25–30 ft. tall, *Johnston & Muller 1341, 1342;* Sierra Hechiceros, Cañon Indio Felipe, along creek and on hillsides, becoming 15 m. tall, *Stewart 167, 182;* Sierra Hechiceros, Cañon Madera, canyon-bottoms and flats, becoming spreading tree 25–30 ft. tall, *Johnston & Muller 1284, 1285, 1289, 1293;* foothills of Sierra Cruces, along arroyo 2 mi. east of Santa Elena, clumps 10 ft. tall, *Johnston & Muller 798;* Sierra Cruces foothills, Boquilla east of Santa Elena, small colony along arroyo-bank, shrub 3–4 m. tall, *Stewart 2269.* CHIHUAHUA: Sierra Rica, Cañon Madera, open slopes and arroyo-banks, abundant tree 5 m. tall, trunk 4 dm. thick, *Stewart 2463, 2548;* 1½ mi. west of Tepopote, tree along arroyo, 35 ft. tall, *Johnston & Muller 1397;* 1 mi. west of San Salvador, large trees along arroyo, becoming 35 ft. tall, trunk 18 inches thick, *Johnston & Muller 1398, 1399;* about bouldery hills on gravelly plain west of Pirámide, common tree 25–30 ft. tall, *Johnston & Muller 1422, 1423, 1424;* 7 mi. south of Pirámide, tree on north slope of grassy hills, 20–25 ft. tall, *Johnston & Muller 1428, 1429;* canyon north of Mesteñas, broad spreading tree 20–25 ft. tall, common on flats and slopes, *Johnston 7955.*

Ranging from Arizona east to trans-Pecos Texas and south into northern

Mexico. Characterized by a combination of furrowed gray bark, dingy gray pubescent leaf-blades oblong to ovate in outline, and usually short-stalked fruit. In eastern Coahuila at times difficult to distinguish from *Q. Mohriana*. Frequently distinguished with difficulty from *Q. invaginata* and *Q. subcordata* of eastern Coahuila and of central and southern Coahuila.

Quercus chihuahuensis Trel. Mem. Nat. Acad. 20: 85. *t. 129, 130* (1924).
Quercus undata Trel. Mem. Nat. Acad. 20: 86. *t. 135* (1924).

VERNACULAR NAME: Encino.

CHIHUAHUA: Sierra Organos, large live-oak, 5 m. tall, common on slopes and along arroyos near Organos, *Stewart & Johnston 2068;* rocky hills near Chihuahua, May 8 and Oct., 1885, *Pringle 74, 355* (ISOTYPE).

Ranging along the Sierra Madre in Chihuahua and Sonora south to Durango and Sinaloa and extending eastward into our area. Trelease, l. c., reports a collection (*Pringle 970*) from the Mapula Mts. The species is characterized by its dense covering of long buff-colored pubescence on leaves and twigs. It is rather closely related to *Q. grisea* but is readily distinguished by its soft almost felt-like indument.

Quercus Mohriana Buckl. ex Rydb. Bull. N. Y. Bot. Gard. 2: 219. *t. 31* (1901), exclusive of Mexican specimens cited, which are *Q. intricata* Trel.

VERNACULAR NAME: Encino.

COAHUILA: Rancho Agua Dulce, lower slopes of Sierra San Manuel, *Wynd & Mueller 306, 307;* Santo Domingo, open slope of igneous hill, *Wynd & Mueller 483;* Santo Domingo, limestone hill, *Wynd & Mueller 451;* Palm Canyon, *Marsh 373;* ravines near Puerto Santa Ana, *Wynd & Mueller 232, 233;* Hillcoat Mesa lying west of Encantada Ranch, July 25, 1938, *Marsh 1427, 1431;* Hillcoat Canyon, west of Buena Vista Ranch, July 13, 1938, *Marsh 1295, 1296;* high mesa in the Sierra Encantada about 16 km. northwest of Rancho Buena Vista, common on rocky hillside, shrub 15 dm. tall, *Stewart 1442;* Valle de los Guajes, 10 km. south of Rancho Buena Vista, common on grassy hillside, shrub 2–3 m. tall, *Stewart 1357;* El Berrendo, shrub or small tree, *White 1798, 1858.*

Ranging in Texas from the western Edwards Plateau and The Breaks of the Plains west to the Glass Mts. and south in the trans-Pecos area into northeastern Coahuila. It is characterized by having its oblong leaves rather dark green above and creamy white with dense tomentum beneath, cf. Muller, Am. Midl. Nat. 24: 708. *fig. 2* (1940). In Coahuila a variety of shade forms are confusing because of their expanded leaves with light tomentum, but even in these the dual coloration is constant, as are also the more fundamental characters of the species.

Quercus undulata Torr. Ann. Lyceum N. Y. 2: 248. *t. 4* (1828).
Quercus Fendleri Liebm. Overs. Danske Vidensk. Forhandl. 1854: 170 (1854).
Quercus undulata γ pedunculata A. DC. Prodr. 16²: 23 (1864).
Quercus undulata β obtusifolia A. DC. Prodr. 16²: 23 (1864).
Quercus venustula Greene, Ill. West Amer. Oaks 69. *t. 32* (1890).
Quercus obtusifolia Rydb. Bull. N. Y. Bot. Gard. 2: 213. *t. 29* (1901), non Don (1825).
Quercus Rydbergiana Cockerell, Torreya 3: 7 (1903).
Quercus undulata Rydbergiana Cockerell, Torreya 3: 86 (1903).
Quercus confusa Woot. & Standl. Contr. U. S. Nat. Herb. 16: 116 (1913).
Quercus media Woot. & Standl. Contr. U. S. Nat. Herb. 16: 116 (1913).

Quercus subobtusifolia A. Camus, Bull. Soc. Bot. France 81: 816 (1934).
Quercus carmenensis Muller, Am. Midl. Nat. 18: 847 (1937).

COAHUILA: Sierra del Carmen, Cañon Sentenela, high slopes with northwest exposure, *Wynd & Mueller 633, 635, 639* (isotype of *Q. carmenensis*).

Ranging from Arizona and Colorado through New Mexico and trans-Pecos Texas into northern Coahuila. There is a possibility that eventually it may be found in the higher mountains of Chihuahua. The species has been variously interpreted and has been one of the most problematic in the southwestern United States and adjacent Mexico. The type collection resembles a form of *Q. grisea* and even looks a bit like *Q. pungens*. Growing in the same locality and radiating out over the entire range of the species are a dozen or more forms of it, some of which have been described as distinct species. The fact that the type collection came from a form of the species characteristic of xeric sites at lower elevations has caused it to be confused with *Q. grisea* and *Q. pungens* and has obscured its true relationships with *Q. Gambelii*. A study of many populations of this variable species in the field (including the type locality) has shown clearly that the form illustrated as *Q. venustula* by Greene is the most common form. It represents a form morphologically about midway between *Q. Gambelii* and the type of *Q. undulata*. *Quercus obtusifolia* is a form of *Q. undulata* even nearer to *Q. Gambelii* than *Q. venustula*. *Quercus carmenensis*, on the other hand, is an even more extreme variant in another direction. A thoroughly conservative treatment permits the recognition of both *Q. Gambelii* and *Q. undulata*, for the two assemblages involved show definite genetic differences; they often occur intermingled in the same habitat without intermediate forms. The narrow shallowly lobed leaves and obligate shrub-habit of *Q. undulata* and its tendency to frequent open drier and lower sites readily distinguish it from the arboreal (sometimes shrubby) *Q. Gambelii*, with its broad deeply lobed leaves.

Quercus Gambelii Nutt. Jour. Acad. Nat. Sci. Phila. n. s. 1: 179 (1848).
Quercus alba β? *Gunnisonii* Torr. Pac. R. R. Rep. 2[1]: 130 (1855).
Quercus stellata δ *Utahensis* A. DC. Prodr. 16[2]: 22 (1864).
Quercus Douglasii β *Gambelii* A. DC. Prodr. 16[2]: 23 (1864).
Quercus Douglasii γ *Novomexicana* A. DC. Prodr. 16[2]: 24 (1864).
Quercus undulata var. *Gambelii* Engelm. Trans. St. Louis Acad. 3: 382, 392 (1876–77).
Quercus utahensis Rydb. Bull. N. Y. Bot. Gard. 2: 202. *t. 25* (1901).
Quercus submollis Rydb. Bull. N. Y. Bot. Gard. 2: 202. *t. 25* (1901).
Quercus Vreelandii Rydb. Bull. N. Y. Bot. Gard. 2: 204. *t. 26* (1901).
Quercus leptophylla Rydb. Bull. N. Y. Bot. Gard. 2: 205. *t. 26* (1901).
Quercus Gunnisonii Rydb. Bull. N. Y. Bot. Gard. 2: 206. *t. 25* (1901).
Quercus nitescens Rydb. Bull. N. Y. Bot. Gard. 2: 207. *t. 27* (1901).
Quercus novomexicana Rydb. Bull. N. Y. Bot. Gard. 2: 208. *t. 27* (1901).
Quercus Eastwoodiae Rydb. Bull. N. Y. Bot. Gard. 2: 210. *t. 28* (1901).
Quercus pauciloba Rydb. Bull. N. Y. Bot. Gard. 2: 215. *t. 30* (1901).
Quercus utahensis var. *submollis* Sargent, Bot. Gaz. 65: 442 (1918).
Quercus Marshii Muller, Am. Midl. Nat. 18: 848 (1937).

COAHUILA: Sierra del Carmen, Sept. 12, 1933, *Marsh 823;* Sierra del Carmen, Cañon Sentenela, high slope with northwest exposure, *Wynd & Mueller 640* (isotype of *Q. Marshii*).

Ranging from South Dakota to Nevada and south into Coahuila and Chihuahua. A species fully as polymorphic as *Q. undulata*, as its list of synonyms attests. Nomenclatorial recognition for the various forms of *Q. Gambelii* seems impractical, for they occur haphazardly throughout the range of the species and are always connected by intermediates. In the southern part of its range *Q. Gambelii* is confined to very high mesic elevations, being particularly common about talus slopes.

Quercus Muehlenbergii Engelm. Trans. St. Louis Acad. 3: 391 (1877).

Quercus Prinus (*acuminata*) Michx. Hist. Chênes Amer. Sept. (20). *t. 8* (1801).

Quercus castanea Mühl., Neue Schr. Ges. Naturf. Fr. Berlin 3: 396 (1801), non Nees (1801, earlier in the year).

Quercus castanea var. *macrophylla* Hampton, Report Ohio State For. Bur. 1: 195 (1886).

Quercus acuminata Sargent, Gard. & Forest 8: 93 (1895).

Quercus Brayi Small, Bull. Torr. Bot. Cl. 28: 558 (1901); Muller, Am. Midl. Nat. 24: 714. *fig. 8* (1940).

Quercus Muehlenbergii var. *Brayi* Sargent, Bot. Gaz. 65: 442 (1918).

Quercus sentenelensis Muller, Am. Midl. Nat. 18: 849 (1937).

COAHUILA: Sierra del Carmen, Cañon Sentenela, *Wynd & Mueller 629* (isotype of *Q. sentenelensis*); Rancho Agua Dulce, wooded canyon on east slope of Sierra San Manuel, *Wynd & Mueller 347;* Sierra Gloria, *Marsh 1905.*

Ranging from the Atlantic region of the United States through central and western Texas (locally) and south in eastern Coahuila into Nuevo Leon. The differences between *Q. sentenelensis* and other forms of *Q. Muehlenbergii* have not proved constant. In fact, any division of the species seems doomed to failure, even though wide differences exist within the species as here accepted. These differences, however, are poorly if at all correlated with geography and with one another. *Quercus Muehlenbergii* is the only member of the series *Prinoides* (Chestnut Oaks) in our range, and its distinction from other species by its evenly repand-toothed leaves, broadly lanceolate to obovate in outline, is readily evident. In our range it is confined to moist stream banks in mesic mountains.

Quercus fusiformis Small, Bull. Torr. Bot. Cl. 28: 357 (1901); Muller, Am. Midl. Nat. 24: 718. *fig. 10* (1940).

Quercus virginiana var. *fusiformis* Sargent, Bot. Gaz. 65: 448 (1918).

COAHUILA: Highway between Muzquiz and Hac. Mariposa, *Wynd & Mueller 285;* Santa Anna Canyon, *Marsh 518;* Monclova, 1880, *Palmer 1274;* Saltillo, single clump, base of hill, 6–8 ft. tall, 1898, *Palmer 299.*

Edwards Plateau, Texas, south into eastern Coahuila, northern Tamaulipas, and Nuevo Leon. In southern Tamaulipas and Nuevo Leon *Q. fusiformis* gives way to *Q. oleoides* without intermediates. On the eastern escarpments of the Edwards Plateau, in Texas, some intermediates occur connecting *Q. fusiformis* and *Q. virginiana* Mill. This transition between *Q. fusiformis* and *Q. virginiana* is not so pronounced and so complete as between *Q. sinuata* var. *breviloba* and *Q. sinuata* and a comparable reduction of *Q. fusiformis* to varietal rank under *Q. virginiana* does not seem to be required. The species occurs on dry limestone slopes and flats and along streams.

Quercus Emoryi Torr. in Emory, Notes Mil. Reconn. 151. *t. 9* (1848); Muller, Am. Midl. Nat. 24: 718. *fig. 11* (1940).

Quercus hastata Liebm. Overs. Danske Vidensk. Forhandl. 1854: 171 (1854).

Quercus Duraznillo Trel. Mem. Nat. Acad. 20: 122. *t. 220, 221* (1924).

Quercus balsequillana Trel. Mem. Nat. Acad. 20: 123. *t. 220* (1924).

Ranging from Arizona east to trans-Pecos Texas and south along the Sierra Madre in Chihuahua and Sonora. Trelease, Mem. Nat. Acad. 20: 121 (1924), reports the species from the "vicinity of Chihuahua (*Palmer 359*)." The apparent absence of this species in Coahuila and eastern Chihuahua is puzzling, for it is abundant in the Chisos Mts. in adjacent Texas, and its common associates in the Chisos, *Q. grisea* and *Q. pungens*, range well south into our area. The small commonly hastate leaves of this species, usually glabrous except for tufts of hair on the lower surface of the blade along the base of the midrib, and its small annual fruits adequately distinguish *Q. Emoryi* from other species of the subgenus *Erythrobalanus* in our area. It is most commonly found on grassy igneous slopes and along waterways in igneous mountains at low elevations.

Quercus saltillensis Trel. Mem. Nat. Acad. 20: 183. *t. 368, 369* (1924).

Quercus carnerosana Trel. Mem. Nat. Acad. 20: 183. *t. 369* (1924).

COAHUILA: San Lorenzo Canyon near Saltillo, April 12, 1906, *Pringle 10229;* Carneros Pass area, up to 30–40 ft. tall, March 1880, *Palmer 1277* (TYPE); Carneros Pass, mountains, Sept. 15, 1889, *Pringle 2802* (isotype of *Q. carnerosana*); Sierra Negras, south of Parras, *Stanford et al. 145.*

Ranging in southern Coahuila and in the Sierra Madre of Nuevo Leon. This shrub is characterized by its annual fruition and by small lanceolate leaves, usually glabrous and entire, or sparsely pubescent beneath and toothed. It is commonly encountered on dry limestone slopes at moderate elevations.

Quercus hypoleucoides A. Camus, Bull. Mus. Hist. Nat. II. 4: 124 (1932); Muller, Am. Midl. Nat. 24: 721. *fig. 13* (1940).

Quercus confertifolia Torr. Bot. Mex. Bound. 207 (1840), non Humb. & Bonpl. (1809).

Quercus hypoleuca Engelm. Trans. St. Louis Acad. 3: 384 (1876), non Miquel (1855).

COAHUILA: Sierra del Carmen, Sept. 12, 1936, *Marsh 831;* Sierra del Carmen, Cañon Sentenela, *Wynd & Mueller 533, 564, 637.* CHIHUAHUA: Peña Fea near Chihuahua, *LeSueur 530.*

Ranging from trans-Pecos Texas to Arizona and south into northern Coahuila and along the Sierra Madre in Chihuahua and Sonora. The characteristically narrowly lanceolate leaves, dark green above and densely white-tomentose beneath, distinguish this species. It occurs on moist slopes and along waterways at high elevations.

Quercus hypoxantha Trel. Mem. Nat. Acad. 20: 170. *t. 339* (1924).

Quercus errans f. *graciliramis* Mueller, Jour. Arnold Arb. 17: 169 (1936).

VERNACULAR NAME: Encino.

COAHUILA: Mountains near Saltillo, small tree, 7000 ft. alt., Apr. 12, 1906, *Pringle 10227* (TYPE); 26 km. northwest of Fraile, top of mountain with *Abies, Pseudotsuga* and *Pinus, Stanford et al. 440;* Sierra del Pino, middle of sierra about 10 mi. north of La Noria, scattered in open pine forests and in chaparral on adjacent slopes below ridge-crest, several erect or ascending stems, 4–8 ft. tall, *Johnston & Muller 566, 567;*

Sierra Madera, Cañon del Agua, tree common in moist upper canyons, up to 25 ft. tall, trunk to 10 inches thick, *Muller 3232;* Sierra Madera, Cañon del Agua, shrub or small tree with hard black checkered bark on branches, abundant in dense oak chaparral on steep slopes at 8000 ft., up to 20 ft. tall, trunks becoming 3 in. thick, *Muller 3213;* Sierra Madera, Cañon del Agua, shrub or small tree, to 20 ft. tall, trunk 3 in. thick, dense pine-oak forest, *Muller 3214;* Sierra Madera, high crest of main ridge east of Picacho Zozaya, open forests, common, shrub 5–8 ft. tall, *Johnston 9021;* Sierra Madera, Cañon Charretera, lower parts of conifer-forests, tree or shrub 8–10 ft. tall, *Johnston 9054.* CHIHUAHUA: Sierra Diablo, 12–14 km. up Cañon Rayo, common on banks of dry arroyo, shrub 5–8 m., *Stewart 921, 921a, 924;* 15 km. up Cañon Rayo, Sierra Diablo, common tree on dry hillside, 10 m. tall, *Stewart 931.*

Ranging from southeastern Chihuahua eastward in the higher mountains of central and southern Coahuila into Nuevo Leon. It occurs usually at high elevations in relatively dry mountains. The species is distinguished by its biennial fruition and its coarsely dentate coriaceous leaves with strongly revolute margins and densely fulvous-tomentose lower surfaces.

Quercus Gravesii Sudw. U. S. Dept. Agric. Misc. Cir. 92: 86 (1927); Muller, Am. Midl. Nat. 24: 724. *fig. 16* (1940).

Quercus coccinea var. *?microcarpa* Torr. Bot. Mex. Bound. 206 (1859).

Quercus texana var. *chesosensis* Sargent, Bot. Gaz. 65: 423 (1918).

Quercus texana var. *stellapila* Sargent, Bot. Gaz. 65: 424 (1918).

Quercus stellipila Parks in Cory, Rhodora 38: 405 (1936).

Quercus chesosensis Muller, Am. Midl. Nat. 18: 850 (1937).

VERNACULAR NAMES: Encino colorado; Encino.

COAHUILA: Sierra del Carmen, Aug. 26, 1936, *Marsh 591;* Jardin del Sur, Sept. 3, 1936, *Marsh 768;* Sierra del Carmen, Cañon Sentenela, *Wynd & Mueller 534, 600, 608, 651;* near Piedra Blanca, igneous hills, *Wynd & Mueller 500;* open country between Santo Domingo and Piedra Blanca, *Wynd & Mueller 493;* Rancho Agua Dulce, Sierra San Manuel, *Wynd & Mueller 234, 330, 383;* ravines near Puerto Santa Ana, *Wynd & Mueller 234;* Palm Canyon, *Marsh 369;* Sorpresa Spring, *Marsh 337;* Sierra Gloria, *Marsh 1965, 2001;* Bocatoche, north slope of Sierra del Oso, abundant along arroyo and scattered on slopes, moderate tree up to 30 ft. tall with hard furrowed gray bark and on upper limbs bark in flat plates, *Muller 3135;* Puerto San Lazaro, Sierra San Lazaro, small to moderate tree to 25 ft. tall, trunk 1 ft. thick, abundant on talus slopes, *Muller 3086, 3087;* northwest slopes of Sierra San Lazaro, *Wynd & Mueller 167, 168, 171;* Hillcoat Canyon west of Buena Vista, July 13, 1938, *Marsh 1275, 1297;* Hillcoat Mesa lying west of Encantada Ranch, July 25, 1938, *Marsh 1429;* Cañon San Enrique, eastern side of Sierra Encantada west of Rancho Buena Vista, common on hillsides, shrub up to 4 m. tall, *Stewart 1392, 1403;* Sierra del Pino, La Noria, common along arroyos, in clumps with 10–20 small trunks from one root, 10–15 ft. tall, *Johnston & Muller 438;* Sierra del Pino, central parts of sierra north of La Noria, dense pine forests and along arroyos, becoming 40 ft. tall, trunk 18 inches thick, *Johnston & Muller 558;* Sierra del Pino, Cañon Ybarra, fairly common on arroyo-banks, tree 5 m. tall, *Stewart 1868;* escarpment on west side of Potrero de la Mula, common tree on middle slopes, 10–20 ft. tall, *Johnston 9209;* Sierra Madera, Cañon Charretera, common tree or large shrub on flats and along arroyos below conifer forests, 20–25 ft. tall, *Johnston 8922;* Sierra Madera, Cañon Charrereta, the common large oak along canyons in the lower parts of the conifer forests, tree 30–40 ft. tall, *Johnston 9045;* Sierra Madera, Cañon Pajarito, abundant constituent of upper arroyo forests, tree to 30 ft. tall, trunk 1 ft. thick, *Muller 3172.*

Ranging from the Davis Mts. in trans-Pecos Texas south to central Coahuila. Until 1936 the species was known only from Texas, but its distribution and abundance in Coahuila are greater than north of the Rio Grande. The deeply incised leaves, with scant pubescence except in the

axils of the veins beneath, and the scarlet color of the foliage in the autumn are very suggestive of *Q. texana* Buckl. and *Q. coccinea* Muench. These characters amply distinguish the species from all others in our range. It is common and conspicuous in mesic forests in canyons in both limestone and igneous mountains.

In addition to the twenty-four species listed above, a number of other species probably occur in our area and may be expected about its margins. A large number of oaks are characteristic of the mountains of Nuevo Leon and of the highlands of western Chihuahua and Durango, and some of them are no doubt present in the poorly botanized mountains of southeastern Coahuila and on the hills and mountains along our western border. Trelease has described and illustrated many of these species in his monograph. Notes and descriptions of additional species of this flora have been published by Muller, Jour. Arnold Arb. 17: 160–179 (1936) and Am. Midl. Nat. 27: 470–490 (1942). Among the oaks of western Texas, illustrated, described, and discussed by Muller, Am. Midl. Nat. 24: 703–728 (1940), there are five species which may be expected in northern Coahuila and Chihuahua: *Q. Vaseyana, Q. turbinella, Q. Tharpii, Q. graciliformis,* and *Q. robusta.* The three last-named are known only from the Chisos Mts.

ULMACEAE

Ulmus multinervosa Muller, Am. Midl. Nat. 18: 842 (1937).

COAHUILA: Rancho Agua Dulce, wooded canyon on eastern slope of Sierra San Manuel, small or moderate-sized tree up to 15 m. tall, *Wynd & Mueller 338* (ISOTYPE).

This species of elm is known only from the type locality. It is closely related to *U. divaricata* Mueller of the Sierra Madre south of Monterrey.

In the Sierra Madera, in central Coahuila, just west of Hacienda del Sierra Madera, there is a canyon called "Cañon del Ulmo." I have been informed by local people that the tree giving the canyon its name is not known to grow elsewhere in the region centering about Ocampo. It may possibly represent *U. multinervosa.*

Celtis pallida Torr. Bot. Mex. Bound. 203 (1859).

VERNACULAR NAMES: Granjeno; Acebuche.

COAHUILA: Allende, *Marsh 1807;* 11 mi. south of Allende, *Johnston 7014;* Hac. Mariposa, *Wynd 671;* Rancho Babia, *Marsh 1202;* Santa Anna Canyon, *Marsh 468;* Muzquiz, *Marsh 2106;* Monclova, *White 1752;* San Francisco, about 50 mi. south of Monclova, *Wynd & Mueller 95;* Cuatro Cienegas, *White 1880;* 9 mi. northwest of El Oro, road to Sierra Mojada, *White 1978;* 11 km. northeast of Jimulco, *Stanford et al. 83a.* CHIHUAHUA: Near Lake Santa Maria, 1899, *Nelson 6427;* near Chihuahua, 1908, *Palmer 113;* Meoqui, 1936, *LeSueur 597;* near Ojito, 1847, *Gregg;* Ojo de San Bernardo, 1847, *Gregg.*

A dense bush 2–4 m. tall, with stiff intricate spinescent branches, which is common in rocky soil, especially along arroyos and on the higher slopes of broad valleys. The small orange-colored drupes are edible. The species ranges from south-central Texas to southern Arizona and south in the arid parts of Mexico to Oaxaca, and from southern Florida south in the drier

parts of the West Indies. Benson, Am. Jour. Bot. 30: 236 (1943), has recently taken up the name *C. tala* var. *pallida* (Torr.) Planch. as the proper one for our plant. The North American species is related to the shrub of southern South America, but can be separated by its firmer, scabrid, usually opaque, usually smaller, less toothed leaves and less spinescent branchlets. In a genus in which specific characters are notoriously few and weak, the differences seem reasonably adequate for the continued recognition of our North American plant as specifically distinct. The South American species is much more variable than *C. pallida*. As Baehni, Candollea 7: 202 (1936), has indicated, the proper name for the southern species is not *C. tala* Gillies (1849), but *C. spinosa* Spreng. (1825).

Celtis Lindheimeri Engelm. ex Koch, Dendr. 2: 434 (1872).

VERNACULAR NAME: Palo blanco.

COAHUILA: Hac. Mariposa, *Wynd & Mueller 258;* Yerda Spring, Muzquiz, *Marsh 263;* Monclova, *White 1705;* Sierra Gloria, *Marsh 2218;* Sierra Hechiceros, Cañon Indio Felipe, *Stewart 179.*

A tree distinguished in our area by its ovate leaves, which are distinctly cordate at the base, rough above, hairy beneath, and at times dentate on the margins. The original material of this species, from near New Braunfels, Texas, has its leaves somewhat more abundantly hairy beneath but is otherwise similar to the specimens from Coahuila.

Celtis laevigata Willd. var. **brachyphylla** Sargent, Bot. Gaz. 67: 225 (1919).

VERNACULAR NAME: Palo blanco.

COAHUILA: Allende, *Marsh 1811;* Hac. Mariposa, *Wynd & Mueller 261;* Monclova, *Marsh 1707;* Sierra Gloria, *Marsh 1983;* Cañon Bocatoche, *Muller 3121;* Saltillo, 1898, *Palmer 160;* Sierra Guajes, Cañon Milagro, *Stewart 1727;* Sierra del Pino, Cañon Ybarra, *Stewart 1829;* canyon at San Antonio de los Alamos, *Johnston & Muller 953.*

This is a form of *C. laevigata* differing from the typical form in having shorter and proportionately broader leaves. The usually ovate leaves are bright green, smooth and glabrous above, and glabrous or practically so beneath. The petioles are usually glabrous. It appears to be confined to the western borders of the range of typical *C. laevigata*, in eastern Coahuila and adjacent Texas.

Celtis reticulata Torr. Ann. Lyc. N. Y. 2: 247 (1828).

VERNACULAR NAME: Palo blanco.

COAHUILA: Jardin del Sur, *Marsh 774;* Yerda Spring, Muzquiz, *Marsh 264;* Cañon Bocatoche, *Muller 3121a;* trail between south end of Hillcoat Mesa and Buena Vista, *Marsh 1499, 1500;* Sierra Cruces, Cañon Tinaja Blanca, *Stewart 2256;* 3 km. southeast of Santa Elena, *Stewart 364;* Carrizo, south base of Sierra Cruces, *Stewart 2169.* CHIHUAHUA: Chihuahua, 1908, *Palmer 148;* 32 mi. north of Escalon on road to Jimenez, *White 2074.*

A common and characteristic plant of the plateau, growing singly or in small groves along arroyos. An unkempt tree of rather disconsolate appearance, usually 3–5 m. tall. The cited specimens represent the form of the species found in trans-Pecos Texas. Its pallid thickish rigid leaves vary from lanceolate to ovate. They are scabrid above and hairy beneath. The species intergrades with *C. laevigata* var. *brachyphylla* and *C. Lindheimeri*,

but seems to be a plant of the higher more arid country to the west of these species.

MORACEAE

Morus microphylla Buckl. Proc. Acad. Nat. Sci. Phila. 1862: 8 (1863).

Morus microphilyra Greene, Leaflets 2: 120 (1910).

VERNACULAR NAME: Mora.

COAHUILA: Sorpresa Spring, Hacienda Mariposa, *Marsh 340;* Cañon Milagro, Sierra Guajes, tree 4 m. tall, *Stewart 1712;* San Antonio de los Alamos, watered canyon, tree 10–20 ft. tall, *Johnston & Muller 919, 920, Johnston 8263;* Cañon Indio Felipe, Sierra Hechiceros, tree 3–7 m. tall in watered canyon, *Johnston & Muller 1347, Stewart 162, 1347.* CHIHUAHUA: 1 km. southeast of Rancho Madera, southeast base of Sierra Rica, tree 4 m. tall, *Stewart 2449;* Chihuahua, river bank, bush to small tree, fruit black, edible, 1908, *Palmer 149;* side canyons off Sacramento River northeast of Chihuahua, April 6, 1886, *Pringle 707;* Santa Eulalia hills, Apr. 4, 1886, *Wilkinson;* west of Meoqui, 1936, *LeSueur 598.*

A tree, usually along streams, ranging from central Texas to Arizona and south to northeastern Sonora and northern Nuevo Leon. The species is somewhat variable in leaf-shape. The type of *M. microphilyra* was based on collections from the "Santa Eulalia Plains" collected by Wilkinson in 1885.

Morus alba L. Sp. Pl. 986 (1753).

VERNACULAR NAME: Mora.

COAHUILA: Hermanas, 1939, *Marsh 1600;* Monclova, 1939, *White 1778.*

The above-cited specimens are probably from plants growing under cultivation.

Morus rubra L. Sp. Pl. 986 (1753).

COAHUILA: Saltillo, 1887, *Sargent.*

Morus celtidifolia H.B.K. Nov. Gen. et Sp. 2: 33 (1817).

VERNACULAR NAME: Moral (Gregg).

COAHUILA: Saltillo, March 29, 1844, *Gregg;* Saltillo, 1905, *Palmer 563;* Saltillo, 1887, *Sargent.*

A species of central Mexico extending north to Monterrey and west into Coahuila.

URTICACEAE

Boehmeria cylindrica Sw. var. **Drummondiana** Wedd. in DC. Prodr. 16[1]: 202 (1869).

COAHUILA: Muzquiz Swamp, *Marsh 909.*

Entering our area from Nuevo Leon and eastern and southern Texas.

Parietaria floridana Nutt. Gen. Pl. 2: 208 (1818).

COAHUILA: Sierra del Carmen, Cañon Sentenela, *Wynd & Mueller 623;* Hermanas, *Marsh 1598;* Muzquiz, *Marsh 2114;* 6 mi. east of Saltillo, 1880, *Palmer 1267;* Saltillo, 1898, *Palmer 133;* west end of Sierra Madera, canyon 2 km. southeast of Puertecito, *Johnston 9315;* San Antonio de los Alamos, *Johnston 8267;* Sierra Cruces, Cañon Tinaja Blanca, *Stewart 2260;* arroyo cut in gypsum near Santa Elena, *Johnston & Muller 234;* Sierra Mojada, near head of Cañon Calabasa, *Stewart 2211.* CHIHUAHUA: Sierra Santa Eulalia, 1885, *Pringle.*

A weak, usually sprawling herb growing in sheltered places in arroyos or about cliffs; not common. Widely distributed across southern parts of the United States and in northern Mexico.

Urtica gracilenta Greene, Bull. Torr. Bot. Cl. 8: 122 (1881).
Urtica granulosa Blake, Jour. Wash. Acad. 14: 284 (1924).

COAHUILA: Cañon Calabasa, Sierra Mojada, rocky arroyo in deep canyon, in shade, not common, *Stewart 2196*.

Arizona to trans-Pecos Texas (Davis Mts.) and southward in the Sierra Madre of Chihuahua.

Urtica chamaedryoides Pursh, Fl. Am. Sept. 113 (1814).

COAHUILA: Muzquiz, Dec. 5, 1936, *Marsh 1054, 1056*.

Ranging from the eastern United States south to southern Mexico.

Urtica spirealis Blume, Mus. Bot. Lugd.-Bat. 2: 152 (1856).

COAHUILA: Sierra Gloria, *Marsh 1961*.

Ranging from Tamaulipas and Nuevo Leon south to central Mexico. The type was collected between Tampico and Real del Monte (*Berlandier 349*). The material from Coahuila has few stinging hairs and has the lower leaf-surfaces with fine appressed hairs. Similar forms have been collected in Nuevo Leon and Tamaulipas, as has also the greener typical form with abundant stinging hairs. Some forms of the species seem to differ from *U. chamaedryoides* chiefly in having the aments slender and elongate rather than dense and glomerate.

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